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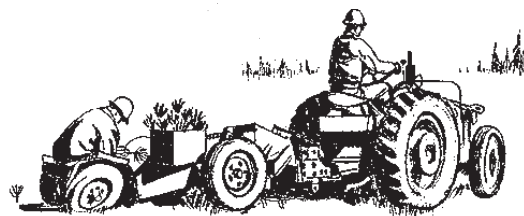
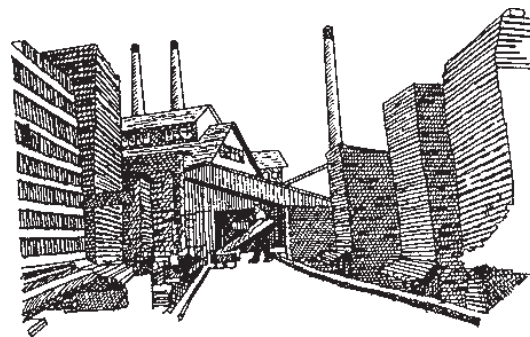


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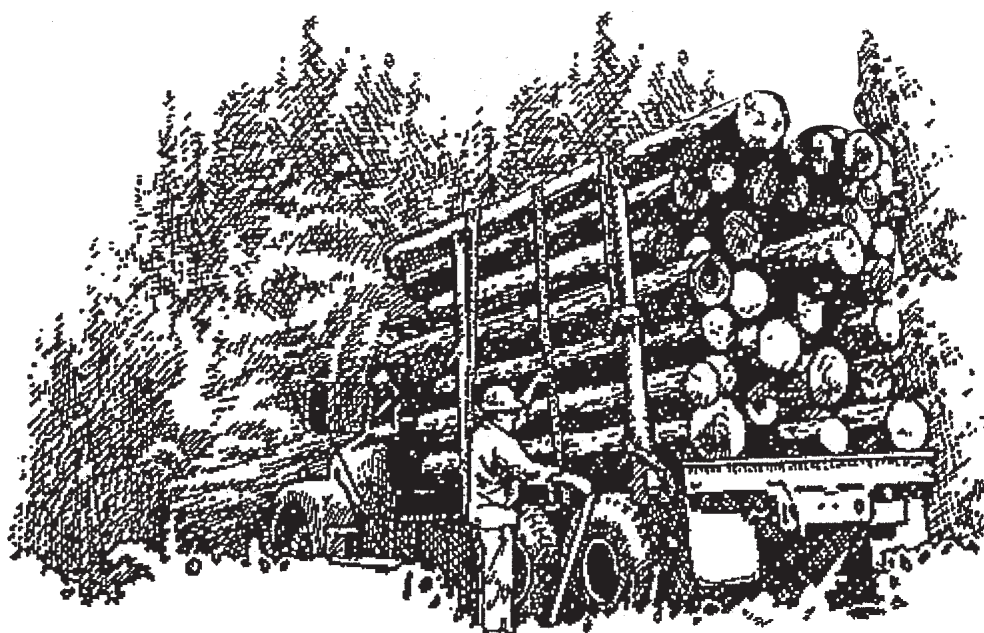
North Carolina's Timber Industry— An Assessment of Timber Product Output and Use, 1999

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Foreword

This report contains the findings of a 1999 sampled survey of all primary wood-using plants in North Carolina, and presents changes in product output and residue use since 1997. It complements the Forest Inventory and Analysis (FIA) periodic inventory of volume and removals from the State's timberland. The canvass was conducted to determine the amount and source of wood receipts and annual timber product drain, by county, in 1999 and to determine interstate and cross-regional movement of industrial roundwood. Only primary wood-using mills were canvassed. Primary mills are those that process roundwood in log or bolt form or as chipped roundwood. Examples of industrial roundwood products are saw logs, pulpwood, veneer logs, poles, and logs used for composite board products. Mills producing products from residues generated at primary and secondary processors were not canvassed. Trees chipped in the woods were included in the estimate of timber drain only if they were delivered to a primary domestic manufacturer.

A sampled canvass of certain wood processors in North Carolina was conducted in 2000 to obtain information for 1999. In addition, roundwood from out-of-State mills known to be using logs or bolts harvested from North Carolina timberland was incorporated into North Carolina production estimates. The mills were canvassed by mail or through personal contact at plant locations. Telephone contacts followed mailed questionnaire responses when

additional information or clarification of a response was necessary. In the event of a nonresponse, data collected in previous surveys were updated using current data collected for mills of similar size, product type, and location. Surveys for all timber products other than pulpwood began in 1961, and are currently conducted every 2 years.

Pulpwood production data were taken from an annual canvass of all southeastern pulpmills. Medium density fiberboard, insulating board, and hardboard plants were included in this survey.

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The Southern Research Station gratefully acknowledges the cooperation and assistance provided by the North Carolina Department of Environment and Natural Resources, Division of Forest Resources in collecting mill data. Appreciation is also extended to forest industry and mill managers for providing timber products information.

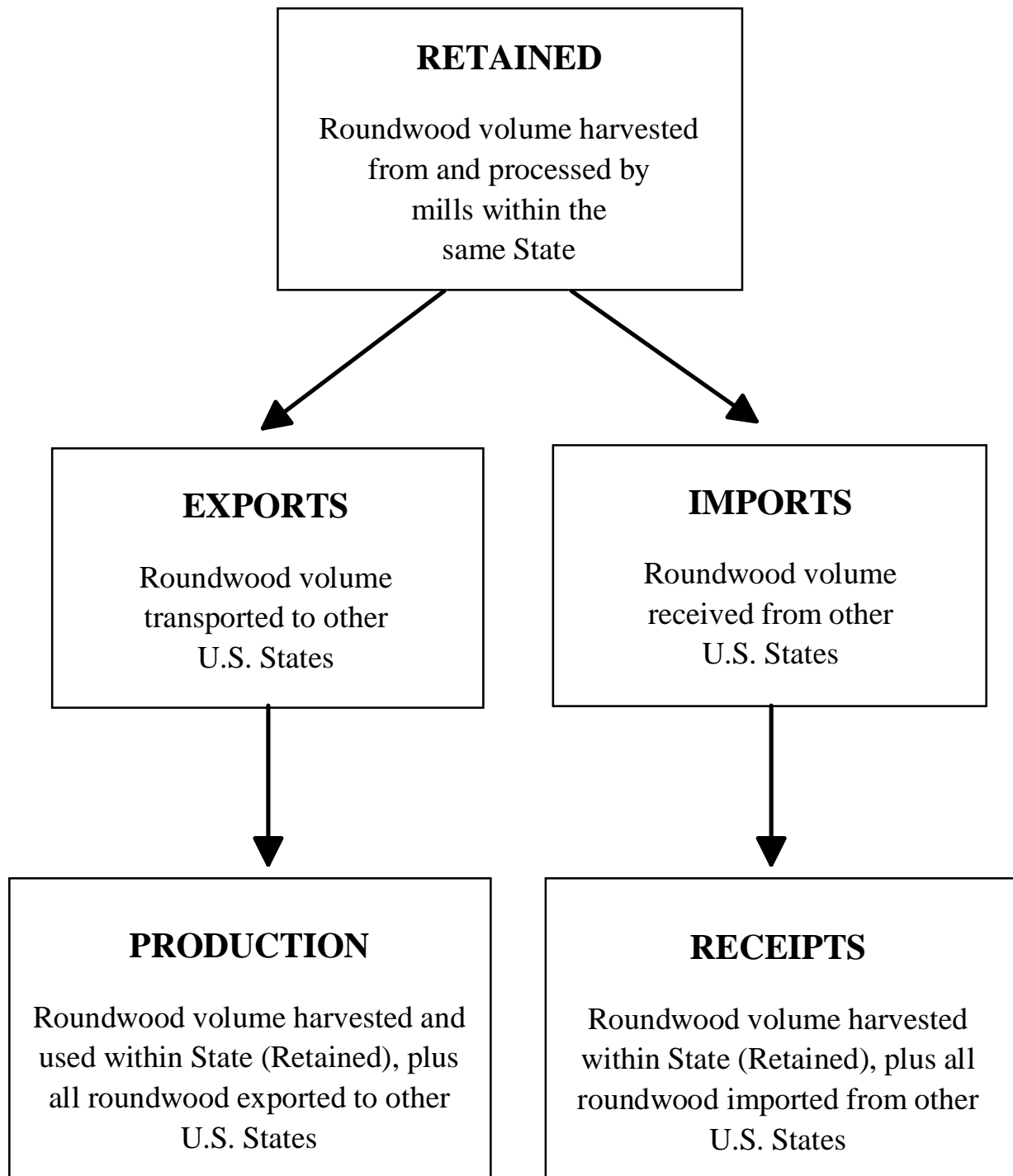


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^a All tables in this report are available in Microsoft® Excel workbook files. Upon request, these files will be supplied on 3½-inch diskettes.

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$$\text{Production} = \text{Retained} + \text{Exports}$$

$$\text{Receipts} = \text{Retained} + \text{Imports}$$

Figure 1—Movement of roundwood exports and imports within the United States.

North Carolina's Timber Industry— An Assessment of Timber Product Output and Use, 1999

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Output of Industrial Timber Products

Note: Certain terms used in this report—retained, export, import, production, and receipts—have specialized meanings unique to the Forest Inventory and Analysis units across the country that deal with timber products output (fig. 1).

All Products

- Between 1997 and 1999, the combined industrial timber products output (TPO) from roundwood and plant byproducts declined 6 percent, from 1.18 to 1.10 billion cubic feet.
- TPO from roundwood was down 77 million cubic feet, or 9 percent, to 793 million cubic feet, while output of plant byproducts was up 1.6 million cubic feet to 311 million cubic feet.

- Output of softwood roundwood products declined 5 percent to 532 million cubic feet, while output of hardwood roundwood products dropped 16 percent to 261 million cubic feet (fig. 2).
- Figures 3 and 4 display softwood and hardwood county-level intensity of roundwood production for all industrial products across North Carolina. The data are depicted in cubic feet produced per acre of census land area. Counties with the highest production intensity are depicted in the darker shades. For softwoods the darkest shade represents more than 30 cubic feet of production per acre, while for hardwoods the darkest shade represents more than 15 cubic feet per acre.

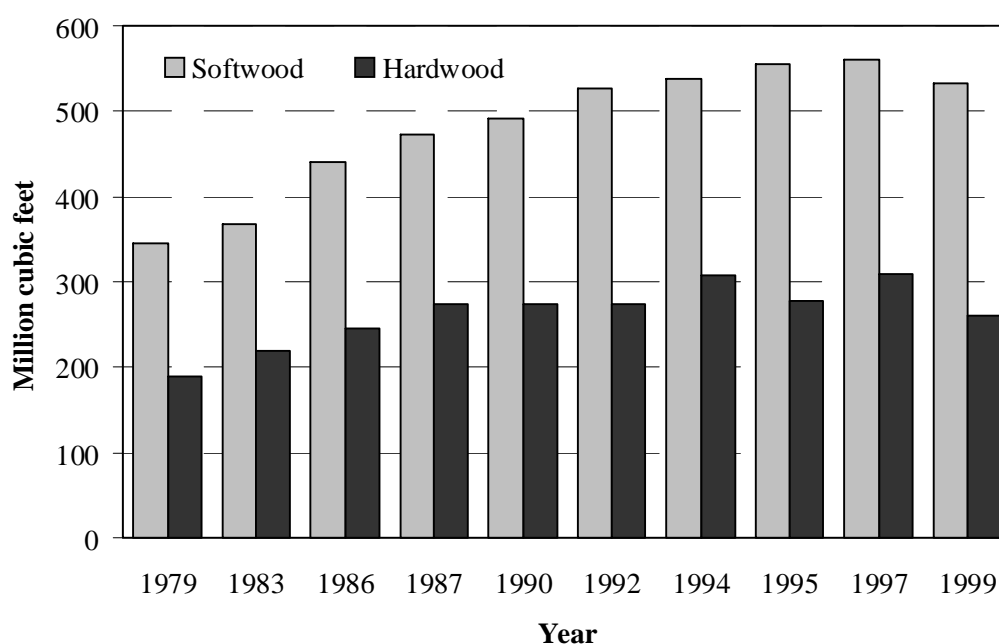


Figure 2—Roundwood production for all products by species group and year (see page 11 for references for individual years).

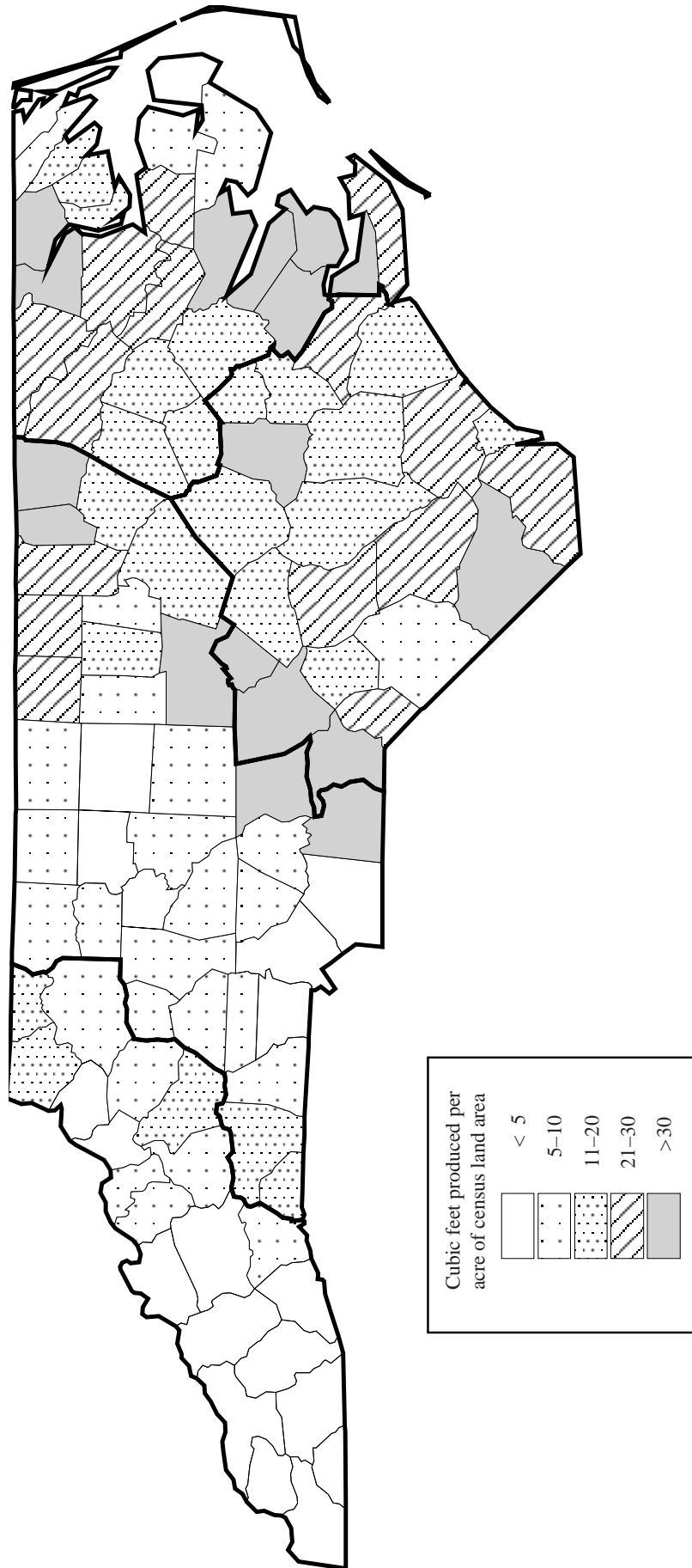


Figure 3—Intensity of roundwood softwood output for all industrial products in North Carolina by county, 1999.

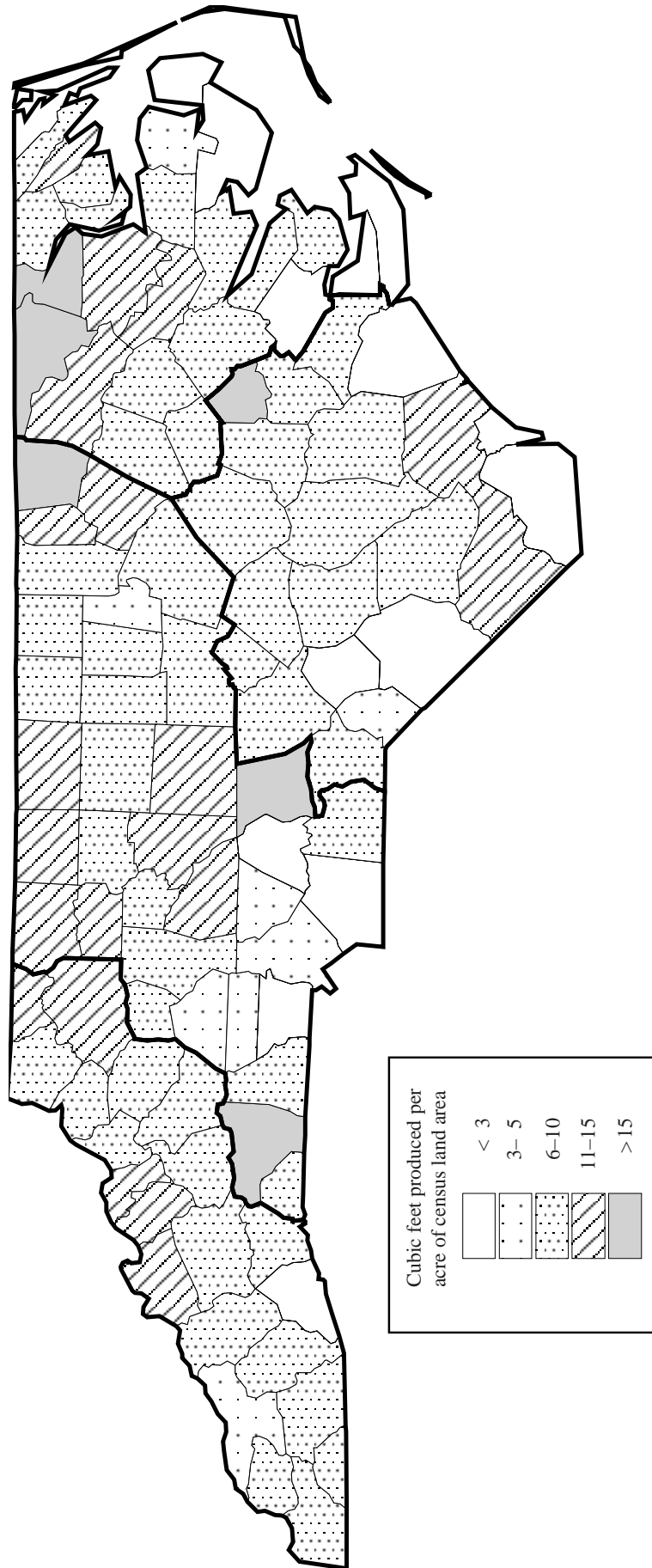


Figure 4—Intensity of roundwood hardwood output for all industrial products in North Carolina by county, 1999.

- Saw logs and pulpwood were the principal roundwood products in 1999. Combined output of these products totaled 694 million cubic feet and accounted for 87 percent of the State's total roundwood output (fig. 5).
- Total receipts at North Carolina mills, which included roundwood harvested and retained in the State as well as roundwood imported from other States, was down 2.0 million cubic feet to 769 million cubic feet. At the same time, the number of primary roundwood-using plants in North Carolina was down from 280 in 1997 to 278 in 1999.

Saw Logs

- Saw logs accounted for 53 percent of the State's total roundwood products. Output of softwood saw logs declined 1 percent to 296 million cubic feet (1.65 billion board feet, International ¼-inch rule), while output of hardwood saw logs was up 2 percent to 126 million cubic feet (758 million board feet, International ¼-inch rule) (fig. 6).
- In 1999, North Carolina had 240 sawmills, a net loss of 3 mills since 1997. Total saw-log receipts were up 9 million cubic feet to 425 million cubic feet. Softwood saw-log

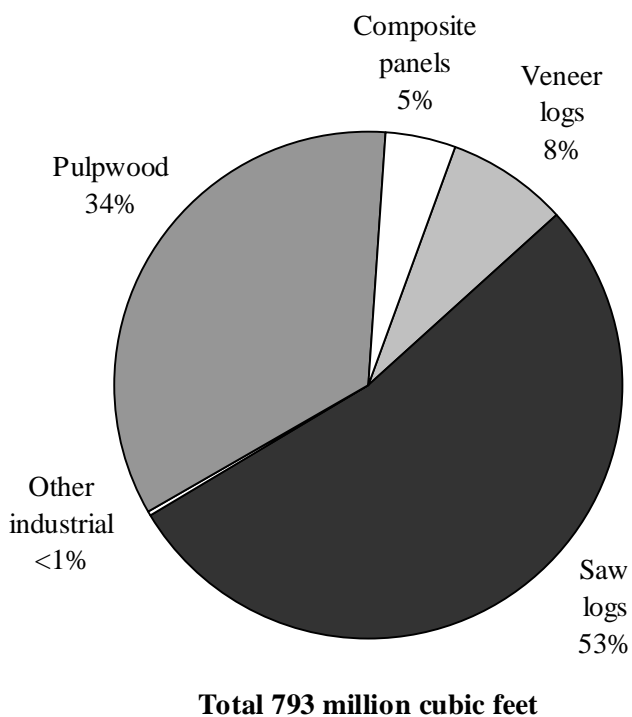


Figure 5—Roundwood production by type of product, 1999.

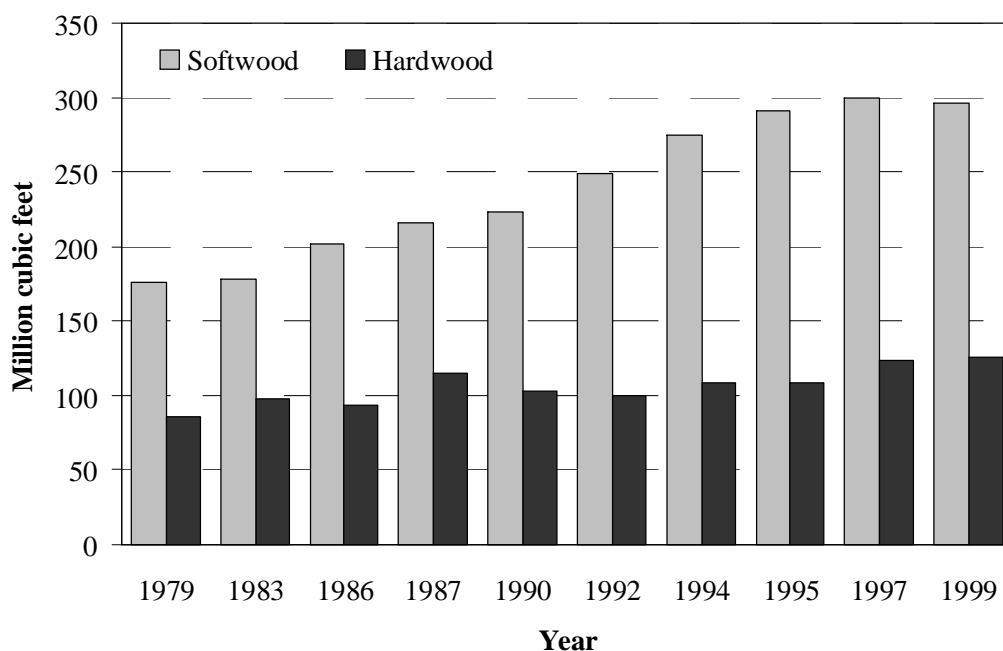


Figure 6—Roundwood saw-log production by species group and year (see page 11 for references for individual years).

receipts were up 2 percent to 290 million cubic feet, while hardwood receipts increased 2 percent to 135 million cubic feet. Of the mills operating in 1999, 28 percent had receipts less than 1 million board feet, while 27 percent had receipts greater than 10 million board feet. Those 64 mills accounted for 82 percent of saw-log receipts.

- North Carolina retained 93 percent of its saw-log production for domestic manufacture, and saw-log imports exceeded exports by 3 million cubic feet in 1999.

Pulpwood

- Pulpwood production, including chipped roundwood, declined 83 million cubic feet to 272 million cubic feet (3.7 million cords) and accounted for 34 percent of the State's total roundwood TPO. Softwood output was down 18 percent to 165 million cubic feet, while hardwood output declined 31 percent to 107 million cubic feet (fig. 7).
- Seven pulpmill facilities were operating and receiving roundwood in North Carolina in 1999, the same as in 1997. Total pulpwood receipts for these mills were down 21 million cubic feet to 244 million cubic feet, accounting for 32 percent of total receipts for all mills.

- Seventy-three percent of roundwood cut for pulpwood was retained for processing by North Carolina pulpmills. Roundwood pulpwood accounted for 63 percent of total known exports and 50 percent of total imports. Roundwood pulpwood exports amounted to 73 million cubic feet, while imports totaled 46 million cubic feet.

Veneer Logs

- Output of veneer logs in 1999 totaled 61 million cubic feet and accounted for 8 percent of the State's total roundwood TPO volume. Softwood veneer production was up 1 percent to 42 million cubic feet (240 million board feet, International 1/4-inch rule), while output of hardwood veneer logs was up 2 percent to 19 million cubic feet (122 million board feet, International 1/4-inch rule) (fig. 8).
- The number of veneer mills operating in North Carolina increased from 23 in 1997 to 24 in 1999. Receipts of veneer logs declined 2 percent to 62 million cubic feet. Softwood veneer receipts were down 1.3 million cubic feet to 39 million cubic feet. Hardwood veneer receipts were down 1 percent to 23 million cubic feet.

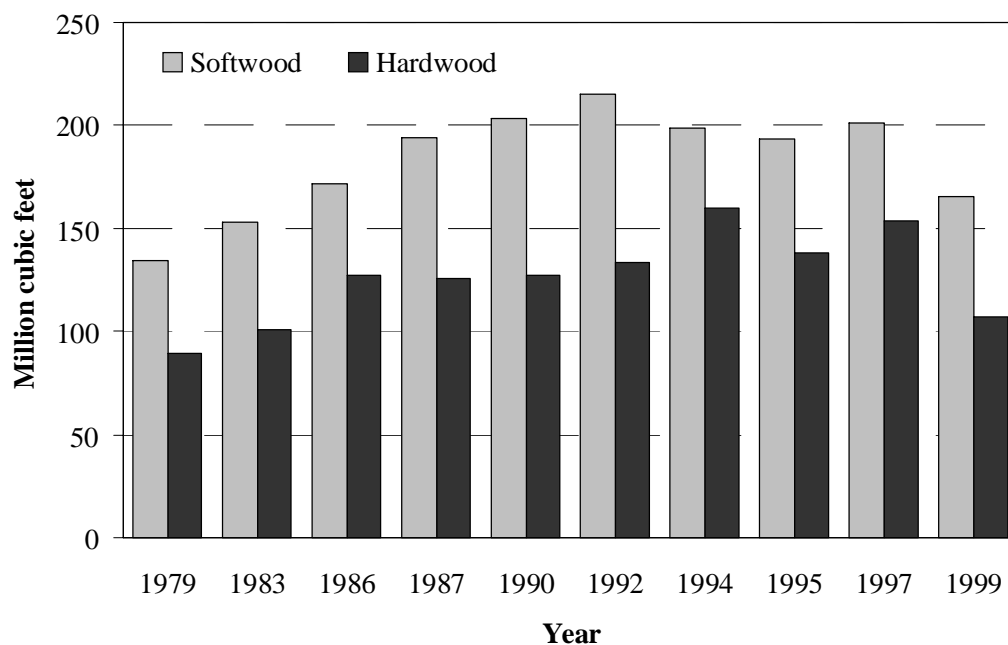


Figure 7—Roundwood pulpwood production by species group and year (see page 11 for references for individual years).

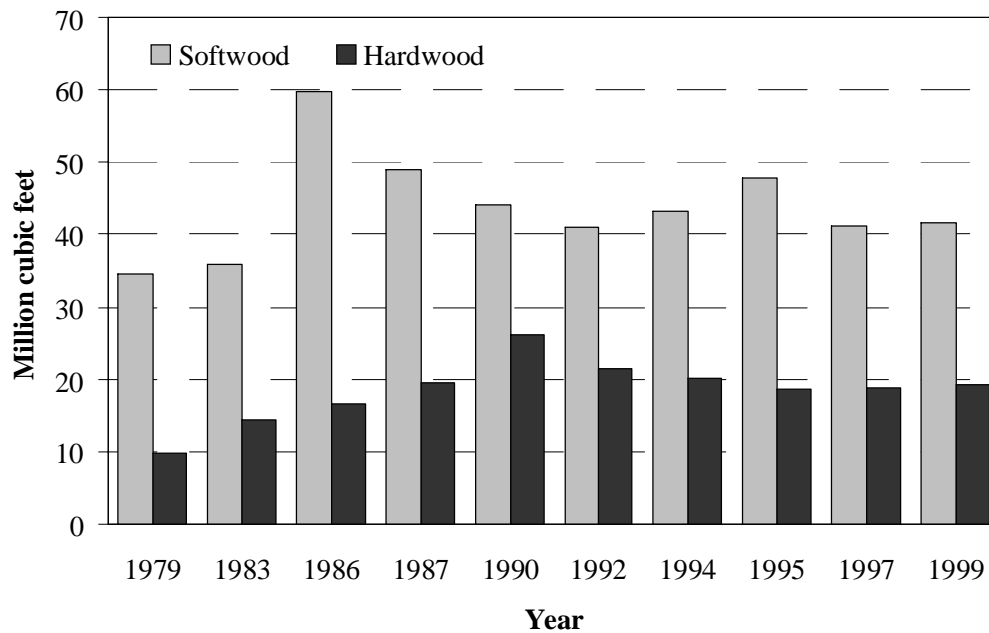


Figure 8—Roundwood veneer-log production by species group and year (see page 11 for references for individual years).

- North Carolina retained 90 percent of its veneer-log production for processing at domestic veneer mills. Imports amounted to 6.7 million cubic feet, while exports totaled 6.2 million cubic feet, making the State a net importer of roundwood veneer logs.

Composite Panels

- Roundwood harvested from North Carolina's forests for composite panels increased 19 percent and totaled 36 million cubic feet (494 thousand cords). Softwood output increased 62 percent to 27 million cubic feet, while hardwood output was down 35 percent to 9 million cubic feet (fig. 9).
- Three composite panel mills were operating in North Carolina in 1999, the same as in 1997. Total receipts for these mills increased 51 percent to 37 million cubic feet.
- Eighty-seven percent of the composite panel production was retained for processing by North Carolina mills. Imports amounted to 5.3 million cubic feet, while exports totaled 4.6 million cubic feet, making the State a net importer of roundwood used for composite panels.

Other Industrial Products

- Roundwood harvested for other industrial uses, e.g., poles, posts, mulch, firewood, logs for log homes, and all other industrial products, totaled 1.8 million cubic feet, down 30 percent from 1997. Softwood made up all of the other industrial products volume.
- The number of plants producing other industrial products remained at four in 1999, the same as in 1997. Receipts of other industrial products totaled 1.4 million cubic feet.
- North Carolina was a net exporter of roundwood used for other industrial products; all of the 420 thousand cubic feet exported and the 53 thousand cubic feet imported were softwood.

Plant Byproducts

- In 1999, processing of primary products in North Carolina mills generated 312 million cubic feet of wood and bark residues. Coarse residues from all primary products amounted to 131 million cubic feet, while bark

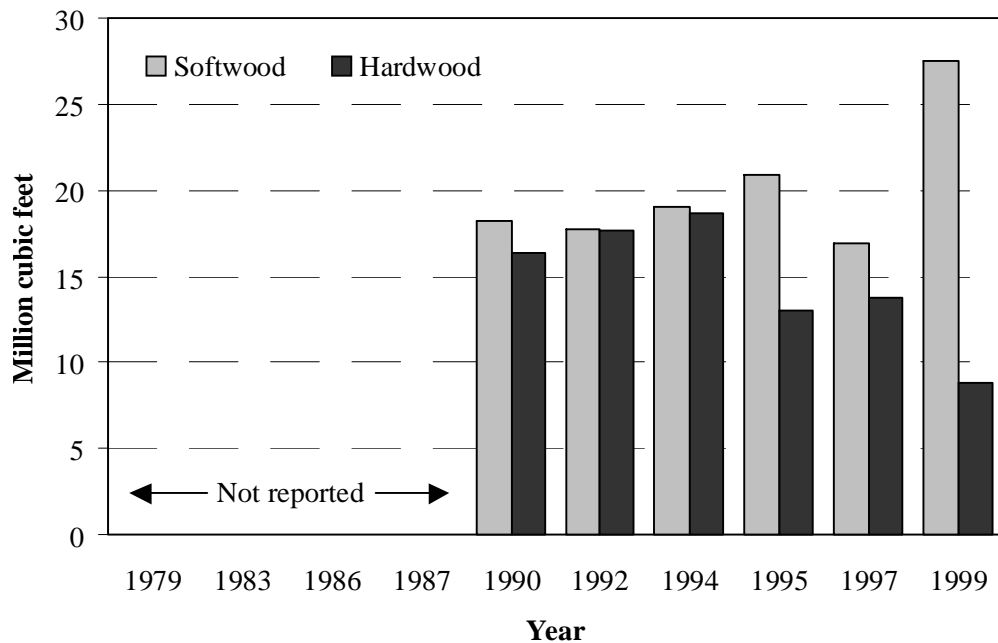


Figure 9—Roundwood production for composite panels by species group and year (see page 11 for references for individual years).

volume totaled 73 million cubic feet. Sawdust and shavings made up 35 percent of total residues, or 108 million cubic feet (fig. 10).

- Less than 1 percent of the wood and bark residues were not used for a product, while 38 percent of the residues were used for industrial fuel (fig. 11). More than 120 million cubic feet, or 92 percent, of the coarse residues were used to manufacture fiber products. Most of the bark was used for industrial fuel or other miscellaneous products, while 80 percent of the sawdust and 8 percent of the shavings were used for industrial fuel. Shavings were used primarily for particleboard manufacture or miscellaneous uses such as bedding.
- The processing of saw logs by sawmills generated 253 million cubic feet of mill residues, or 81 percent of the total residues produced (fig. 12).

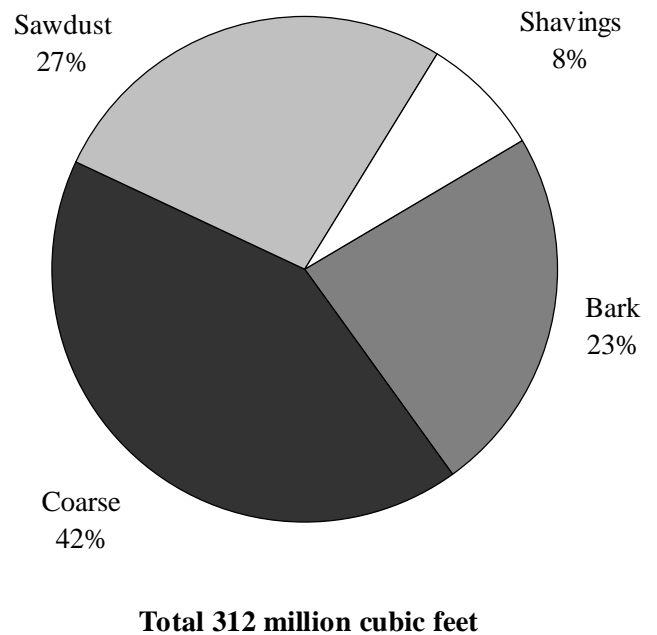


Figure 10—Primary mill residue by residue type, 1999.

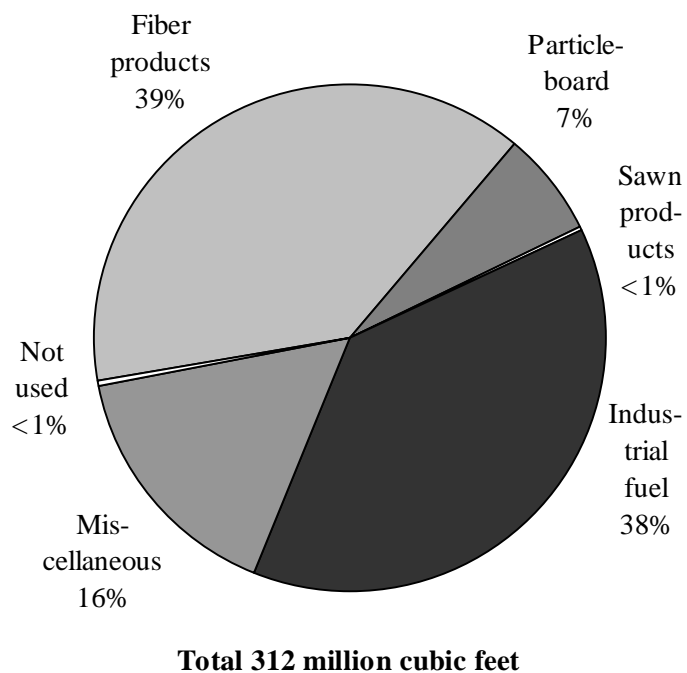


Figure 11—Disposal of residue by product, 1999.

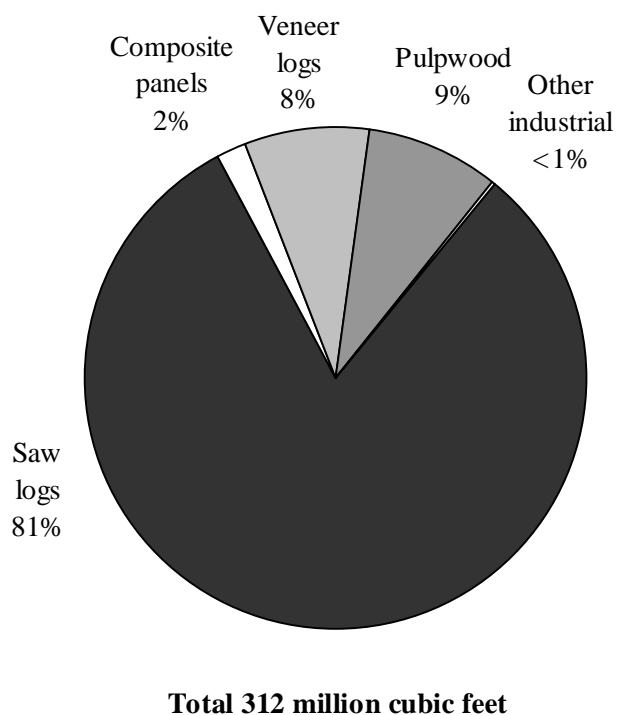


Figure 12—Primary mill residue produced by roundwood type, 1999.

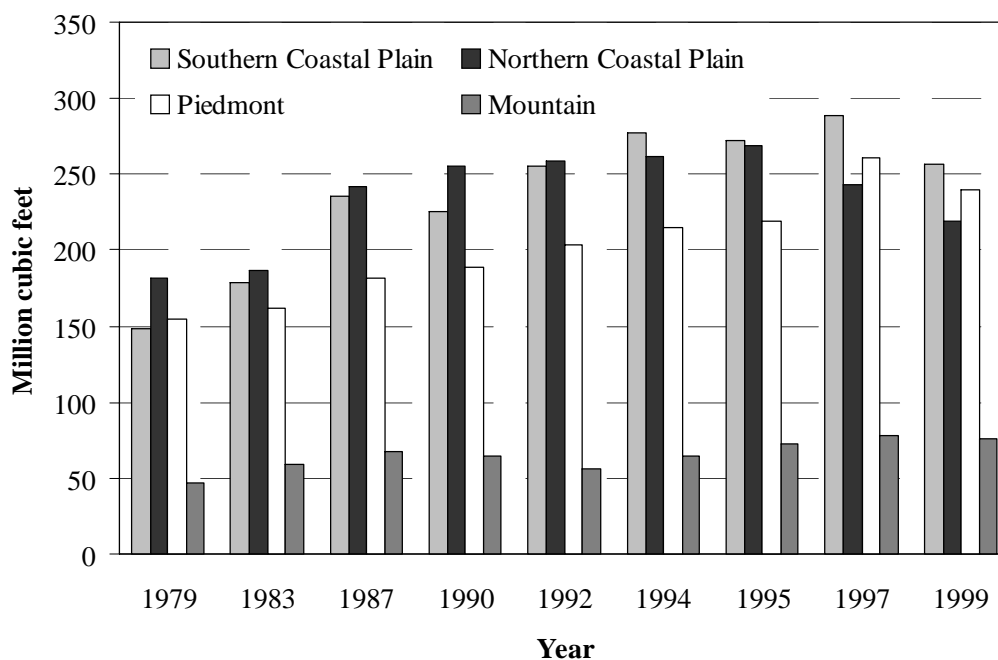


Figure 13—Roundwood production for all products by survey region and year (see page 11 for references for individual years).

Regional Trends

- Output of industrial roundwood products declined across all regions of North Carolina. The Mountain region had the smallest decline at 2 percent (fig. 13).

Southern Coastal Plain Region

- Roundwood output from the Southern Coastal Plain region totaled 257 million cubic feet, down 11 percent. Softwood output declined 8 percent to 197 million cubic feet, while hardwood output was down 19 percent to 60 million cubic feet.
- Saw-log production of 113 million cubic feet accounted for 44 percent of the total roundwood output for the region. Pulpwood production of 103 million cubic feet accounted for 40 percent of the region's TPO and 38 percent of the State's roundwood pulpwood output.
- In the Southern Coastal Plain region, 38 primary wood-using plants were operating during 1999: 30 sawmills, 5 veneer or plywood mills, 1 pulpmill, 1 composite panel mill, and 1 other miscellaneous mill. These mills processed 32 percent of the State's total roundwood output.

Northern Coastal Plain Region

- The Northern Coastal Plain region had a 10-percent decline in roundwood output. Production was down from 243 million cubic feet in 1997 to 219 million cubic feet in 1999.
- Saw-log production of 117 million cubic feet accounted for 53 percent of the region's total roundwood output and 28 percent of the State's total saw-log output. Production of pulpwood was down 20 percent to 89 million cubic feet, but still accounted for 40 percent of the region's total roundwood output and 33 percent of the State's total roundwood pulpwood output.
- The 45 mills operating in the Northern Coastal Plain region in 1999 included 36 sawmills, 5 veneer or plywood mills, and 4 pulpmills. These mills processed 28 percent of the State's total roundwood output.

Piedmont Region

- Roundwood output from the Piedmont region of North Carolina totaled 240 million cubic feet, a decline of 8 percent. Roundwood production from this region accounted for 30 percent of the total roundwood TPO for the State.
- Saw-log production of 140 million cubic feet accounted for 58 percent of the region's total roundwood output. Pulpwood production declined by 35 percent to 62 million cubic feet, accounting for 26 percent of the region's total TPO.
- The 116 primary wood-using plants operating in the Piedmont region included 101 sawmills, 10 veneer or plywood mills, 2 composite panel mills, and 3 other miscellaneous mills.

Mountain Region

- Roundwood output from the Mountain region totaled 76 million cubic feet, down 2 percent since 1997.
- Saw-log production declined 6 percent to 52 million cubic feet and accounted for 68 percent of the region's total roundwood output. Pulpwood production was up 2 million cubic feet to 19 million cubic feet and accounted for 24 percent of the region's total TPO.
- In the Mountain region, 79 primary wood-using plants were operating during 1999: 73 sawmills, 4 veneer or plywood mills, and 2 pulpmills.

Total Roundwood Output

Using the most recent inventory data for North Carolina, product output by source, ownership, and detailed species group was estimated.

Source

- In addition to the 793 million cubic feet of industrial roundwood output, an estimated 60 million cubic feet was harvested for domestic fuelwood, bringing North Carolina's total roundwood output to 853 million cubic feet.

- Ninety-four percent of total roundwood output was considered growing-stock volume (sawtimber and poletimber) from timberland sources. Other sources (such as saplings; stumps, tops, and limbs of trees on timberland; and trees on nonforest land) contributed an estimated 51 million cubic feet, or 6 percent of total roundwood output (fig. 14).

Ownership

- An estimated 654 million cubic feet, or 77 percent, of the total roundwood output came from nonindustrial private forest (NIPF) lands. Forest industry lands contributed 153 million cubic feet, or 18 percent of the output. Public lands made up the remaining 5 percent, or 46 million cubic feet (fig. 15).

Species

- The loblolly and shortleaf pine group provided the most volume of any softwood species group; at 413 million cubic feet, it accounted for 77 percent of the total softwood output (fig. 16). Other yellow pine types accounted for another 13 percent of softwood output. The red oak and white oak groups combined accounted for 112 million cubic feet, or 36 percent of total hardwood output (fig. 17).

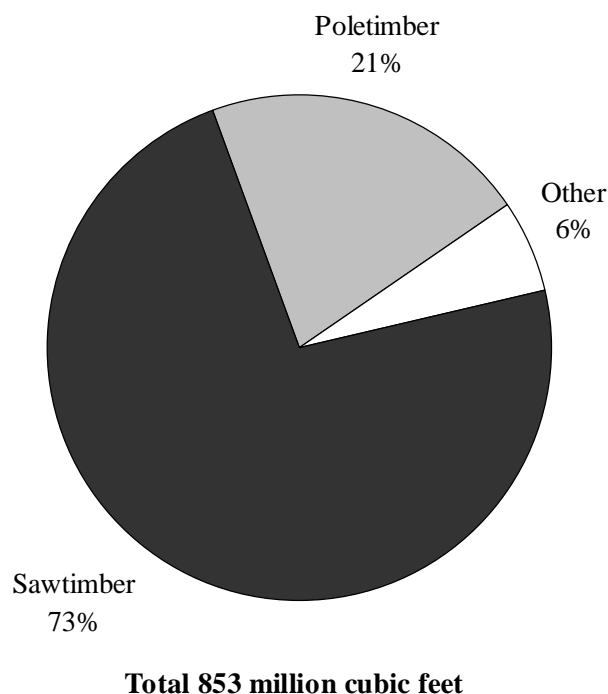


Figure 14—Roundwood output by source, 1999.

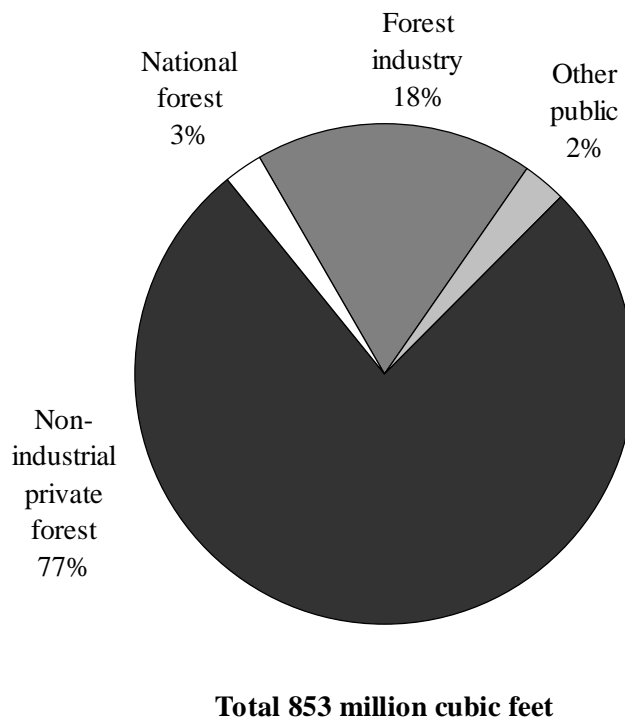


Figure 15—Roundwood output by ownership, 1999.

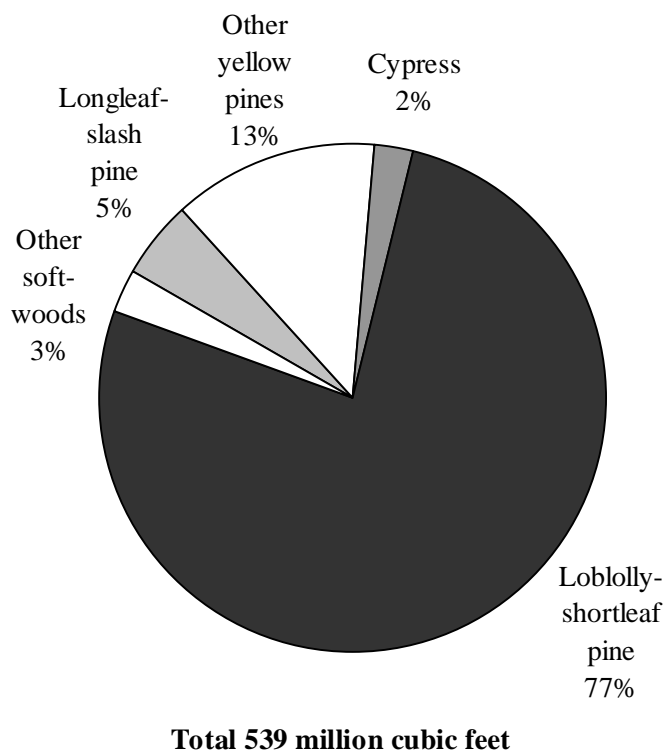


Figure 16—Roundwood output by softwood species group, 1999.

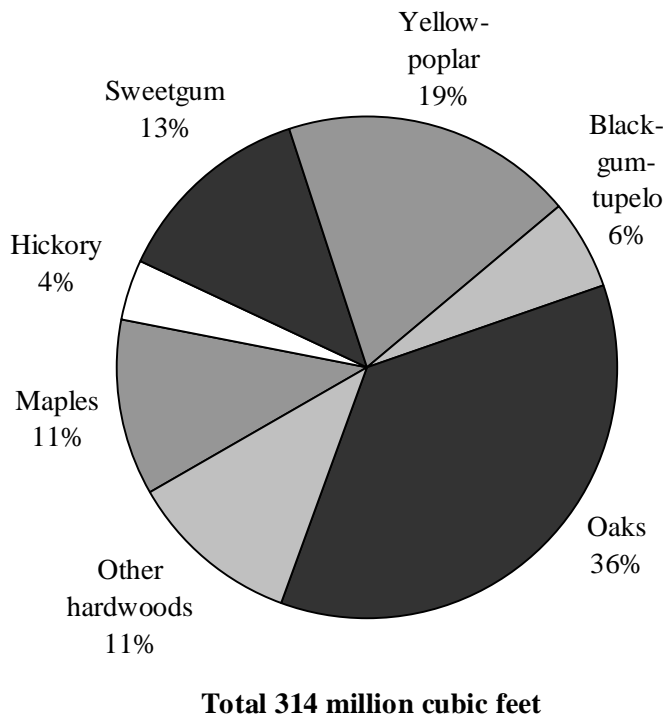


Figure 17—Roundwood output by hardwood species group, 1999.

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Definition of Terms

Board foot. Unit of measure applied to roundwood. It relates to lumber that is 1-foot long, 1-foot wide, and 1-inch thick (or its equivalent).

Byproducts. Primary wood products, e.g., pulp chips, animal bedding, fuelwood, recycled from mill residues.

Composite products. Roundwood products manufactured into chips, wafers, strands, flakes, shavings, or sawdust and then reconstituted into a variety of panel and engineered lumber products.

Consumption. The quantity of a commodity, such as pulpwood, utilized by a particular mill or group of mills.

Drain. The volume of roundwood removed from any geographic area where timber is grown.

Exports. The volume of roundwood utilized by mills outside the State where timber was cut.

Fiber products. Byproducts used in the manufacture of pulp, paper, paperboard, and composite products, such as waferboard or chipboard.

Fuelwood production. The volume of roundwood harvested to produce some form of energy, e.g., heat, steam, in residential, industrial, or institutional settings.

Growing-stock removals. The growing-stock volume removed from poletimber and sawtimber trees in the timberland inventory. (Note: Includes volume removed for roundwood products, logging residues, and other removals.)

Growing-stock trees. Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. Growing-stock trees must contain at least one 12-foot or two 8-foot logs in the saw-log portion, currently or potentially (if too small to qualify). The log(s) must meet dimension and merchantability standards and have, currently or potentially, one-third of the gross board-foot volume in sound wood.

Growing-stock volume. The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b. of the central stem.

Hardwoods. Dicotyledonous trees, usually broadleaf and deciduous.

Soft hardwoods. Hardwood species with an average specific gravity of 0.50 or less, such as gums, yellow-poplar, cottonwoods, red maple, basswoods, and willows.

Hard hardwoods. Hardwood species with an average specific gravity greater than 0.50, such as oaks, hard maples, hickories, and beech.

Imports. The volume of roundwood delivered to a mill or group of mills in a specific State but harvested outside that State.

Industrial fuelwood. A roundwood product, with or without bark, used to generate energy at a manufacturing facility such as a wood-using mill.

Industrial roundwood products. Any primary use of the main stem of a tree, such as saw logs, pulpwood, veneer logs, intended to be processed into primary wood products such as lumber, wood pulp, sheathing, at primary wood-using mills.

International 1/4-inch rule. A log rule or formula for estimating the board-foot volume of logs, allowing 1/2-inch of taper for each 4-foot length. The rule appears in a number of forms that allow for kerf. In the form used by FIA, a 1/4-inch of kerf is assumed. This rule is used as the USDA Forest Service standard log rule in the Eastern United States.

Log. A primary forest product harvested in long, primarily 8-, 12-, and 16-foot lengths.

Logging residues. The unused merchantable portion of growing-stock trees cut or destroyed during logging operations.

Merchantable portion. That portion of live trees 5.0 inches d.b.h. and larger between a 1-foot stump and a minimum 4.0-inch top d.o.b. on the central stem. That portion of primary forks from the point of occurrence to a minimum 4.0-inch top d.o.b. is included.

Merchantable volume. Solid-wood volume in the merchantable portion of live trees.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land. Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

Nongrowing-stock sources. The net volume removed from the nongrowing-stock portions of poletimber and sawtimber trees (stumps, tops, limbs, cull sections of central stem) and from any portion of a rough, rotten, sapling, dead, or nonforest tree.

Other forest land. Forest land other than timberland and productive reserved forest land. It includes available and reserved forest land that is incapable of producing annually 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

Other products. A miscellaneous category of roundwood products, e.g., cooperage, excelsior, shingles, and mill residue byproducts (charcoal, bedding, mulch, etc.).

Other removals. The growing-stock volume of trees removed from the inventory by cultural operations such as timber stand improvement, land clearing, and other changes in land use, resulting in the removal of the trees from timberland.

Other sources. (see: Nongrowing-stock sources.)

Ownership. The property owned by one ownership unit, including all parcels of land in the United States.

National forest land. Federal land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III land.

Forest industry land. Land owned by companies or individuals operating primary wood-using plants.

Nonindustrial private forest (NIPF) land. Privately owned land excluding forest industry land.

Corporate. Owned by corporations, including incorporated farm ownerships.

Individual. All lands owned by individuals, including farm operators.

Other public. An ownership class that includes all public lands except national forests.

Miscellaneous Federal land. Federal land other than national forests.

State, county, and municipal land. Land owned by States, counties, and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

Plant residues. Wood material generated in the production of timber products at primary manufacturing plants.

Coarse residues. Material, such as slabs, edgings, trim, veneer cores and ends, which is suitable for chipping.

Fine residues. Material, such as sawdust, shavings, and veneer chippings, which is not suitable for chipping.

Plant byproducts. Residues (coarse or fine) used in the further manufacture of industrial products for consumer use or as fuel.

Unused plant residues. Residues (coarse or fine) that are not used for any product, including fuel.

Posts, poles, and pilings. Roundwood products milled (cut or peeled) into standard sizes (lengths and circumferences) to be put in the ground to provide vertical and lateral support in buildings, foundations, utility lines, and fences. May also include nonindustrial (unmilled) products.

Poletimber-size trees. Softwoods 5.0 to 8.9 inches d.b.h. and hardwoods 5.0 to 10.9 inches d.b.h.

Primary wood-using plants. Industries that convert roundwood products (saw logs, veneer logs, pulpwood, etc.) into primary wood products, such as lumber, veneer or sheathing, wood pulp.

Production. The total volume of roundwood harvested from land within a State, regardless of where it is consumed. Production is the sum of timber harvested and used within a State, and all roundwood exported to other States.

Pulpwood. A roundwood product that will be reduced to individual wood fibers by chemical or mechanical means. The fibers are used to make a broad generic group of pulp products that includes paper products, as well as chipboard, fiberboard, insulating board, and paperboard.

Receipts. The quantity or volume of industrial roundwood received at a mill or by a group of mills in a State, regardless of the geographic source. Volume of roundwood receipts is equal to the volume of roundwood retained in a State plus roundwood imported from other States.

Retained. Roundwood volume harvested from and processed by mills within the same State.

Rotten trees. Live trees of commercial species not containing at least one 12-foot saw log, or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, primarily because of rot or missing sections, and with less than one-third of the gross board-foot tree volume in sound material.

Rough trees. Live trees of commercial species not containing at least one 12-foot saw log, or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, primarily because of roughness, poor form, splits, and cracks, and with less than one-third of the gross board-foot tree volume in sound material; and live trees of noncommercial species.

Roundwood (roundwood logs). Logs, bolts, or other round sections cut from trees for industrial manufacture or consumer uses.

Roundwood chipped. Any timber cut primarily for industrial manufacture, delivered to nonpulp mills, chipped, and then sold to pulpmills for use as fiber. Includes tops, jump sections, whole trees, and pulpwood sticks.

Roundwood products. Any primary product, such as lumber, poles, pilings, pulp, or fuelwood that is produced from roundwood.

Roundwood product drain. That portion of total drain used for a product.

Salvable dead trees. Standing or downed dead trees that were formerly growing stock and considered merchantable. Trees must be at least 5.0 inches d.b.h. to qualify.

Saplings. Live trees 1.0 to 5.0 inches d.b.h.

Saw log. A roundwood product, usually 8 feet in length or longer, processed into a variety of sawn products such as lumber, cants, pallets, railroad ties, and timbers.

Saw-log portion. The part of the bole of sawtimber trees between a 1-foot stump and the saw-log top.

Saw-log top. The point on the bole of sawtimber trees above which a conventional saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

Sawtimber-size trees. Softwoods 9.0 inches d.b.h. and larger and hardwoods 11.0 inches d.b.h. and larger.

Sawtimber volume. Growing-stock volume in the saw-log portion of sawtimber-sized trees in board feet (International ¼-inch rule).

Seedlings. Trees less than 1.0 inch d.b.h. and greater than 1 foot tall for hardwoods, greater than 6 inches tall for softwood, and greater than 0.5 inch in diameter at ground level for longleaf pine.

Select red oaks. A group of several red oak species composed of cherrybark, Shumard, and northern red oaks. Other red oak species are included in the other red oaks group.

Select white oaks. A group of several white oak species composed of white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks. Other white oak species are included in the other white oaks group.

Softwoods. Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Standard cord. A unit of measure applied to roundwood, usually bolts or split wood. It is a stack of wood 4 feet high, 4 feet wide, and 8 feet long encompassing 128 cubic feet of wood, bark, and air space. This usually translates to approximately 75.0 to 81.0 cubic feet of solid wood for pulpwood, because pulpwood is more uniform.

Standard unit. A unit measure applied to roundwood timber products. Board feet (International ¼ rule) is the standard unit used for saw logs and veneer; cords are used for pulpwood, composite panel, and fuelwood; hundred pieces for poles; thousand pieces for posts; and thousand cubic feet for all other miscellaneous forest products.

Timberland. Forest land capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Timber products. Roundwood products and byproducts.

Timber products output. The total volume of roundwood products from all sources plus the volume of byproducts

recovered from mill residues (equals roundwood product drain).

Timber removals. The total volume of trees removed from the timberland inventory by harvesting, cultural operations such as stand improvement, land clearing, or changes in land use. (Note: Includes roundwood products, logging residues, and other removals.)

Tree. Woody plants having one erect perennial stem or trunk at least 3 inches d.b.h., a more or less definitely formed crown of foliage, and a height of at least 13 feet (at maturity).

Upper-stem portion. The part of the main stem of sawtimber trees above the saw-log top and the minimum top

diameter of 4.0 inches outside bark, or to the point where the main stem breaks into limbs.

Utilization studies. Studies conducted on active logging operations to develop factors for merchantable portions of trees left in the woods (logging residues), logging damage, and utilization of the unmerchantable portion of growing-stock trees and nongrowing stock trees.

Veneer log. A roundwood product either rotary cut, sliced, stamped, or sawn into a variety of veneer products such as plywood, finished panels, veneer sheets, or sheathing.

Weight. A unit of measure for mill residues, expressed as oven-dry tons (2,000 oven-dry pounds).

Conversion Factors^a

Saw logs

Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16556 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot

Veneer logs

Softwood	0.17391 cubic foot = 1 board foot 5.75 board feet = 1 cubic foot
Hardwood	0.15873 cubic foot = 1 board foot 6.30 board feet = 1 cubic foot

Pulpwood^b

Softwood	72.5 cubic feet per cord
Hardwood	76.6 cubic feet per cord

^a Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in North Carolina during the most recent survey period.

^b Cubic feet of solid wood per cord.

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Table 1—Output of industrial products by product and species group, North Carolina, 1997 and 1999

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	299,278	296,290	-2,988	-1.0
Hardwood	123,306	125,778	2,472	2.0
Total	422,584	422,068	-516	-0.1
Veneer logs				
Softwood	41,163	41,748	585	1.4
Hardwood	18,907	19,310	403	2.1
Total	60,070	61,058	988	1.6
Pulpwood ^a				
Softwood	200,833	164,991	-35,842	-17.8
Hardwood	153,735	106,854	-46,881	-30.5
Total	354,568	271,845	-82,723	-23.3
Composite panels				
Softwood	16,909	27,450	10,541	62.3
Hardwood	13,704	8,860	-4,844	-35.3
Total	30,613	36,310	5,697	18.6
Other industrial				
Softwood	2,534	1,778	-756	-29.8
Hardwood	0	0	0	--
Total	2,534	1,778	-756	-29.8
All industrial				
Softwood	560,717	532,257	-28,460	-5.1
Hardwood	309,652	260,802	-48,850	-15.8
Total	870,369	793,059	-77,310	-8.9
Byproduct output				
Softwood	205,991	207,323	1,332	0.6
Hardwood	103,369	103,597	228	0.2
Total	309,360	310,920	1,560	0.5
Total output				
Softwood	766,708	739,580	-27,128	-3.5
Hardwood	413,021	364,399	-48,622	-11.8
Total	1,179,729	1,103,979	-75,750	-6.4

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulp mills (9,642,000 cubic feet in 1997 and 7,369,000 cubic feet in 1999).

**Table 2—Roundwood receipts by product and species group,
North Carolina, 1997 and 1999**

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	282,949	289,528	6,579	2.3
Hardwood	133,012	135,271	2,259	1.7
Total	415,961	424,799	8,838	2.1
Veneer logs				
Softwood	40,001	38,652	-1,349	-3.4
Hardwood	23,151	22,973	-178	-0.8
Total	63,152	61,625	-1,527	-2.4
Pulpwood ^a				
Softwood	155,512	144,808	-10,704	-6.9
Hardwood	109,662	99,480	-10,182	-9.3
Total	265,174	244,288	-20,886	-7.9
Composite panels				
Softwood	13,577	26,136	12,559	92.5
Hardwood	10,951	10,888	-63	-0.6
Total	24,528	37,024	12,496	50.9
Other industrial				
Softwood	2,306	1,411	-895	-38.8
Hardwood	0	0	0	--
Total	2,306	1,411	-895	-38.8
Total output				
Softwood	494,345	500,535	6,190	1.3
Hardwood	276,776	268,612	-8,164	-2.9
Total	771,121	769,147	-1,974	-0.3

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (10,110,000 cubic feet in 1997 and 8,419,000 cubic feet in 1999).

Table 3—Number of primary wood-using plants by industry, North Carolina, 1979–1999

Industry	Year									
	1979	1983	1986	1987	1990	1992	1994	1995	1997	1999
Sawmills	478	429	336	362	308	306	275	273	243	240
Veneer mills	31	33	32	31	32	29	27	27	23	24
Pulpmills	8	8	8	8	8	8	8	8	7	7
Composite panel mills	0	0	4	4	5	4	4	4	3	3
Other mills	13	14	15	17	13	10	8	8	4	4
All plants	530	484	395	422	366	357	322	320	280	278

Table 4—Roundwood receipts by sawmill size, North Carolina, 1997 and 1999

Sawmill size class ^a	1997			1999		
	Number of mills	Thousand board feet	Percent of volume	Number of mills	Thousand board feet	Percent of volume
<i>Million board feet</i>						
<1.0	70	23,447	1	67	23,031	1
1.0–4.99	76	206,186	9	74	199,407	8
5.0–9.99	33	210,080	9	35	228,410	9
10.0–49.99	54	1,126,742	47	54	1,112,407	46
>50	10	806,704	34	10	860,111	36
Total	243	2,373,159	100	240	2,423,366	100

^a Based on volume received as opposed to actual capacity.

Table 5—Roundwood receipts by species and type of mill, North Carolina, 1999

Species	Type of mill						
	All mills	Veneer mills			OSB ^a and panels	Pulpmills ^b	Other mills
		Sawmills	Pine plywood	Other veneer			
			<i>Thousand cubic feet</i>				
Softwood							
Yellow pine	332,616	266,445	38,456	168	26,136	NA	1,411
White pine	20,380	20,364	0	16	0	NA	0
Cedar	57	45	0	12	0	NA	0
Cypress	1,728	1,728	0	0	0	NA	0
Other softwood	946	946	0	0	0	NA	0
Unclassified	144,808	0	0	0	0	144,808	0
Total softwoods	500,535	289,528	38,456	196	26,136	144,808	1,411
Hardwood							
Blackgum and tupelo	5,531	3,911	638	453	529	NA	0
Soft maple	7,360	6,794	214	0	352	NA	0
Sweetgum	19,673	11,188	5,043	1,805	1,637	NA	0
Yellow-poplar	59,048	43,544	7,652	5,793	2,059	NA	0
Other soft hardwood	7,480	1,480	0	30	5,970	NA	0
Hickory	3,094	3,084	0	10	0	NA	0
Red oak	33,691	33,310	77	304	0	NA	0
White oak	25,899	25,612	70	217	0	NA	0
Other hard hardwood	7,356	6,348	0	667	341	NA	0
Unclassified	99,480	0	0	0	0	99,480	0
Total hardwoods	268,612	135,271	13,694	9,279	10,888	99,480	0
All species	769,147	424,799	52,150	9,475	37,024	244,288	1,411

NA = not applicable.

^a OSB = oriented strand board.^b Collected only by softwood and hardwood and includes roundwood chipped.**Table 6—Industrial roundwood movement by year and species group, North Carolina, 1997 and 1999**

Year	Production	Exported to other States	Retained	Imported from other States	Receipts
<i>Thousand cubic feet</i>					
Softwood					
1997	560,717	119,115	441,602	52,743	494,345
1999	532,257	86,107	446,150	54,385	500,535
Hardwood					
1997	309,652	70,182	239,470	37,306	276,776
1999	260,802	30,156	230,646	37,966	268,612
All species					
1997	870,369	189,297	681,072	90,049	771,121
1999	793,059	116,263	676,796	92,351	769,147

**Table 7—Industrial roundwood movement by product and species group,
North Carolina, 1999**

Product and species group	Production	Exported to other States	Retained	Imported from other States	Receipts
<i>Thousand cubic feet</i>					
Saw logs					
Softwood	296,290	24,760	271,530	17,998	289,528
Hardwood	125,778	6,870	118,908	16,363	135,271
Total	422,068	31,630	390,438	34,361	424,799
Veneer logs					
Softwood	41,748	5,092	36,656	1,996	38,652
Hardwood	19,310	1,074	18,236	4,737	22,973
Total	61,058	6,166	54,892	6,733	61,625
Pulpwood^a					
Softwood	164,991	51,799	113,192	31,616	144,808
Hardwood	106,854	21,689	85,165	14,315	99,480
Total	271,845	73,488	198,357	45,931	244,288
Composite panels					
Softwood	27,450	4,036	23,414	2,722	26,136
Hardwood	8,860	523	8,337	2,551	10,888
Total	36,310	4,559	31,751	5,273	37,024
Other industrial					
Softwood	1,778	420	1,358	53	1,411
Hardwood	0	0	0	0	0
Total	1,778	420	1,358	53	1,411
All products					
Softwood	532,257	86,107	446,150	54,385	500,535
Hardwood	260,802	30,156	230,646	37,966	268,612
Total	793,059	116,263	676,796	92,351	769,147

^a Includes roundwood chipped.

Table 8—Saw-log volume by destination, source, and species group, North Carolina, 1999

Destination and source	All species	Species group	
		Softwood	Hardwood
Thousand cubic feet			
North Carolina (retained)	390,438	271,530	118,908
Exports to:			
Florida	132	102	30
Georgia	343	259	84
South Carolina	9,998	9,689	309
Tennessee	1,099	481	618
Virginia	20,058	14,229	5,829
Total	31,630	24,760	6,870
Imports from:			
Florida	37	37	0
Georgia	1,855	193	1,662
South Carolina	10,429	3,277	7,152
Tennessee	2,684	1,220	1,464
Virginia	19,356	13,271	6,085
Total	34,361	17,998	16,363

Table 9—Veneer volume by destination, source, and species group, North Carolina, 1999

Destination and source	All species	Species group	
		Softwood	Hardwood
<i>Thousand cubic feet</i>			
North Carolina (retained)	54,892	36,656	18,236
Exports to:			
Georgia	820	140	680
South Carolina	1,418	1,047	371
Virginia	3,928	3,905	23
Total	6,166	5,092	1,074
Imports from:			
Alabama	51	0	51
Georgia	197	0	197
Indiana	49	0	49
Kentucky	125	0	125
Maryland	85	0	85
Ohio	203	0	203
Pennsylvania	441	0	441
South Carolina	2,051	1,762	289
Tennessee	317	12	305
Virginia	3,011	222	2,789
West Virginia	203	0	203
Total	6,733	1,996	4,737

Table 10—Pulpwood volume by destination, source, and species group, North Carolina, 1999^a

Destination and source	All species	Species group	
		Softwood	Hardwood
<i>Thousand cubic feet</i>			
North Carolina (retained)	198,357	113,192	85,165
Exports to:			
Georgia	218	135	83
Kentucky	4,003	0	4,003
South Carolina	59,003	49,033	9,970
Tennessee	721	439	282
Virginia	9,543	2,192	7,351
Total	73,488	51,799	21,689
Imports from:			
Georgia	353	339	14
South Carolina	23,672	19,826	3,846
Tennessee	5,957	0	5,957
Virginia	15,949	11,451	4,498
Total	45,931	31,616	14,315

^a Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills.

Table 11—Composite panel volume by destination, source, and species group, North Carolina, 1999

Destination and source	All species	Species group	
		Softwood	Hardwood
<i>Thousand cubic feet</i>			
North Carolina (retained)	31,751	23,414	8,337
Exports to:			
Virginia	4,559	4,036	523
Total	4,559	4,036	523
Imports from:			
Virginia	5,273	2,722	2,551
Total	5,273	2,722	2,551

Table 12—Other industrial volume by destination, source, and species group, North Carolina, 1999^a

Destination and source	All species	Species group	
		Softwood	Hardwood
Thousand cubic feet			
North Carolina (retained)	1,358	1,358	0
Exports to:			
Florida	19	19	0
South Carolina	116	116	0
Virginia	285	285	0
Total	420	420	0
Imports from:			
South Carolina	53	53	0
Total	53	53	0

^a Includes poles, posts, mulch, firewood, log homes, charcoal, and all other industrial mills.

Table 13—Primary mill residue volume by roundwood type, species group, and residue type, North Carolina, 1999

Roundwood type and species group	All types	Residue type			
		Bark	Coarse	Sawdust	Shavings
Thousand cubic feet					
Saw logs					
Softwood	172,563	19,434	78,923	51,344	22,862
Hardwood	80,095	14,021	38,324	26,570	1,180
Total	252,658	33,455	117,247	77,914	24,042
Veneer logs					
Softwood	15,219	2,683	8,090	4,446	0
Hardwood	9,520	2,487	4,978	2,055	0
Total	24,739	5,170	13,068	6,501	0
Pulpwood					
Softwood	14,533	14,533	0	0	0
Hardwood	12,168	12,168	0	0	0
Total	26,701	26,701	0	0	0
Composite panels					
Softwood	4,350	4,350	0	0	0
Hardwood	2,446	2,446	0	0	0
Total	6,796	6,796	0	0	0
Other industrial ^a					
Softwood	1,126	943	183	0	0
Hardwood	0	0	0	0	0
Total	1,126	943	183	0	0
Total					
Softwood	207,791	41,943	87,196	55,790	22,862
Hardwood	104,229	31,122	43,302	28,625	1,180
Total	312,020	73,065	130,498	84,415	24,042

^a Includes poles, pilings, posts, and other industrial products.

Table 14—Disposal of residue at primary wood-using plants by product, species group, and type of residue, North Carolina, 1997 and 1999

Product and species group	All types		Bark		Coarse		Sawdust		Shavings	
	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999
<i>Thousand cubic feet</i>										
Fiber products										
Softwood	84,209	82,193	0	0	80,070	81,806	1,486	169	2,653	218
Hardwood	37,465	38,862	62	57	36,269	38,517	1,067	235	67	53
Total	121,674	121,055	62	57	116,339	120,323	2,553	404	2,720	271
Particleboard										
Softwood	8,476	19,062	0	0	2,188	2,999	1,118	5,540	5,170	10,523
Hardwood	1,698	1,803	46	46	770	708	602	683	280	366
Total	10,174	20,865	46	46	2,958	3,707	1,720	6,223	5,450	10,889
Charcoal/chemical wood										
Softwood	0	1,823	0	0	0	0	0	1,823	0	0
Hardwood	0	0	0	0	0	0	0	0	0	0
Total	0	1,823	0	0	0	0	0	1,823	0	0
Sawn products										
Softwood	4,316	536	0	0	4,316	536	0	0	0	0
Hardwood	647	575	0	0	647	575	0	0	0	0
Total	4,963	1,111	0	0	4,963	1,111	0	0	0	0
Fuel										
Softwood	73,234	70,089	26,202	25,494	1,449	1,139	42,028	41,993	3,555	1,463
Hardwood	49,221	48,824	20,346	19,804	4,006	3,142	24,537	25,411	332	467
Total	122,455	118,913	46,548	45,298	5,455	4,281	66,565	67,404	3,887	1,930
Miscellaneous										
Softwood	35,756	33,620	15,183	16,354	622	473	9,709	6,135	10,242	10,658
Hardwood	14,338	13,533	11,781	11,071	541	130	1,750	2,038	266	294
Total	50,094	47,153	26,964	27,425	1,163	603	11,459	8,173	10,508	10,952
Not used										
Softwood	461	468	92	95	244	243	125	130	0	0
Hardwood	669	632	151	144	255	230	263	258	0	0
Total	1,130	1,100	243	239	499	473	388	388	0	0
All products										
Softwood	206,452	207,791	41,477	41,943	88,889	87,196	54,466	55,790	21,620	22,862
Hardwood	104,038	104,229	32,386	31,122	42,488	43,302	28,219	28,625	945	1,180
Total	310,490	312,020	73,863	73,065	131,377	130,498	82,685	84,415	22,565	24,042

Table 15—Roundwood timber products output by product and species group, Southern Coastal Plain of North Carolina, 1997 and 1999

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	96,415	95,204	-1,211	-1.3
Hardwood	19,618	18,232	-1,386	-7.1
Total	116,033	113,436	-2,597	-2.2
Veneer logs				
Softwood	27,310	28,851	1,541	5.6
Hardwood	6,082	3,791	-2,291	-37.7
Total	33,392	32,642	-750	-2.2
Pulpwood ^a				
Softwood	84,594	66,740	-17,854	-21.1
Hardwood	47,014	35,994	-11,020	-23.4
Total	131,608	102,734	-28,874	-21.9
Composite panels				
Softwood	4,065	5,226	1,161	28.6
Hardwood	1,842	2,352	510	27.7
Total	5,907	7,578	1,671	28.3
Other industrial				
Softwood	1,643	942	-701	-42.7
Hardwood	0	0	0	--
Total	1,643	942	-701	-42.7
All industrial				
Softwood	214,027	196,963	-17,064	-8.0
Hardwood	74,556	60,369	-14,187	-19.0
Total	288,583	257,332	-31,251	-10.8

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (3,806,000 cubic feet in 1997 and 1,448,000 cubic feet in 1999).

Table 16—Roundwood timber products output by county, product, and species group, Southern Coastal Plain of North Carolina, 1999

County	All products		Saw logs		Veneer logs		Pulpwood ^a		Composite panels		Other industrial	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
<i>Thousand cubic feet</i>												
Bladen	12,407	4,397	5,924	1,758	1,584	107	4,842	2,532	0	0	57	0
Brunswick	14,259	974	5,728	48	1,109	75	7,354	851	0	0	68	0
Columbus	28,681	6,218	17,545	1,104	3,448	167	7,564	4,947	0	0	124	0
Cumberland	11,210	2,471	4,233	863	3,290	244	3,536	1,364	100	0	51	0
Duplin	7,689	4,580	3,766	854	475	540	2,747	2,790	701	396	0	0
Greene	2,756	8,110	2,191	402	0	0	565	7,708	0	0	0	0
Harnett	5,956	2,066	2,362	512	1,250	477	1,175	548	1,169	529	0	0
Hoke	4,606	749	1,830	557	950	0	1,742	192	0	0	84	0
Johnston	8,349	4,878	3,248	2,191	893	491	3,331	1,694	877	502	0	0
Jones	6,433	2,104	3,057	223	94	0	3,282	1,881	0	0	0	0
Lee	8,327	1,170	5,071	867	1,429	5	1,705	298	0	0	122	0
Lenoir	3,123	1,382	1,292	409	0	0	1,539	841	292	132	0	0
Moore	14,448	2,424	10,558	1,511	950	345	2,576	568	100	0	264	0
New Hanover	1,394	46	377	0	633	28	384	18	0	0	0	0
Onslow	9,813	1,364	2,315	363	988	94	6,510	907	0	0	0	0
Pender	12,618	5,871	4,362	1,045	475	321	7,724	4,505	0	0	57	0
Richmond	9,107	1,685	6,883	1,357	0	0	2,224	328	0	0	0	0
Robeson	5,566	1,757	2,712	1,069	792	0	1,998	688	0	0	64	0
Sampson	11,044	3,931	4,486	1,267	2,161	93	3,177	2,042	1,169	529	51	0
Scotland	4,821	671	2,292	456	1,267	0	1,262	215	0	0	0	0
Wayne	14,356	3,521	4,972	1,376	7,063	804	1,503	1,077	818	264	0	0
All counties	196,963	60,369	95,204	18,232	28,851	3,791	66,740	35,994	5,226	2,352	942	0

^a Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (1,448,000 cubic feet in 1999).

Table 17—Roundwood timber products output by product and species group, Northern Coastal Plain of North Carolina, 1997 and 1999

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	88,182	96,545	8,363	9.5
Hardwood	19,758	20,399	641	3.2
Total	107,940	116,944	9,004	8.3
Veneer logs				
Softwood	10,499	7,116	-3,383	-32.2
Hardwood	5,470	5,781	311	5.7
Total	15,969	12,897	-3,072	-19.2
Pulpwood ^a				
Softwood	67,381	63,126	-4,255	-6.3
Hardwood	43,196	25,538	-17,658	-40.9
Total	110,577	88,664	-21,913	-19.8
Composite panels				
Softwood	3,923	350	-3,573	-91.1
Hardwood	4,040	158	-3,882	-96.1
Total	7,963	508	-7,455	-93.6
Other industrial				
Softwood	206	206	0	--
Hardwood	0	0	0	--
Total	206	206	0	--
All industrial				
Softwood	170,191	167,343	-2,848	-1.7
Hardwood	72,464	51,876	-20,588	-28.4
Total	242,655	219,219	-23,436	-9.7

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulp mills (1,340,000 cubic feet in 1997 and 1,517,000 cubic feet in 1999).

Table 18—Roundwood timber products output by county, product, and species group, Northern Coastal Plain of North Carolina, 1999

County	All products		Saw logs		Veneer logs		Pulpwood ^a		Composite panels		Other industrial	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
<i>Thousand cubic feet</i>												
Beaufort	29,749	3,266	12,369	1,236	901	70	16,479	1,960	0	0	0	0
Bertie	13,027	5,535	7,105	2,226	702	1,586	5,197	1,723	0	0	23	0
Camden	1,245	1,492	660	334	94	151	491	1,007	0	0	0	0
Carteret	8,002	165	5,512	1	94	6	2,396	158	0	0	0	0
Chowan	1,988	769	1,406	423	0	77	582	269	0	0	0	0
Craven	18,354	789	11,726	362	1,167	0	5,461	427	0	0	0	0
Currituck	604	471	484	294	94	116	26	61	0	0	0	0
Dare	63	87	50	0	0	0	13	87	0	0	0	0
Edgecombe	4,324	2,082	2,286	1,139	189	16	1,849	927	0	0	0	0
Gates	6,876	1,788	5,300	553	472	192	1,076	1,043	0	0	28	0
Halifax	12,468	5,260	7,300	3,086	569	976	4,576	1,198	0	0	23	0
Hertford	11,025	3,928	7,181	2,096	545	93	3,271	1,739	0	0	28	0
Hyde	3,484	1,135	1,586	304	237	0	1,661	831	0	0	0	0
Martin	7,971	3,495	5,600	1,027	426	490	1,945	1,978	0	0	0	0
Nash	6,435	3,373	4,144	1,643	189	607	2,102	1,123	0	0	0	0
Northampton	9,268	6,476	4,461	2,270	775	377	4,004	3,829	0	0	28	0
Pamlico	9,716	1,451	6,585	81	94	0	3,037	1,370	0	0	0	0
Pasquotank	2,431	2,155	1,424	661	142	125	865	1,369	0	0	0	0
Perquimans	2,473	1,354	1,428	337	237	113	808	904	0	0	0	0
Pitt	6,815	2,407	3,950	810	0	0	2,665	1,518	175	79	25	0
Tyrrell	1,632	1,103	711	209	0	23	921	871	0	0	0	0
Washington	6,009	1,553	3,491	490	0	73	2,490	990	0	0	28	0
Wilson	3,384	1,742	1,786	817	189	690	1,211	156	175	79	23	0
All counties	167,343	51,876	96,545	20,399	7,116	5,781	63,126	25,538	350	158	206	0

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (1,517,000 cubic feet in 1999).

Table 19—Roundwood timber products output by product and species group, Piedmont of North Carolina, 1997 and 1999

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	89,814	83,901	-5,913	-6.6
Hardwood	53,982	55,990	2,008	3.7
Total	143,796	139,891	-3,905	-2.7
Veneer logs				
Softwood	3,338	5,625	2,287	68.5
Hardwood	4,214	5,994	1,780	42.2
Total	7,552	11,619	4,067	53.9
Pulpwood ^a				
Softwood	43,622	29,840	-13,782	-31.6
Hardwood	52,075	31,975	-20,100	-38.6
Total	95,697	61,815	-33,882	-35.4
Composite panels				
Softwood	7,196	20,947	13,751	191.1
Hardwood	6,576	5,598	-978	-14.9
Total	13,772	26,545	12,773	92.7
Other industrial				
Softwood	525	504	-21	-4.0
Hardwood	0	0	0	--
Total	525	504	-21	-4.0
All industrial				
Softwood	144,495	140,817	-3,678	-2.5
Hardwood	116,847	99,557	-17,290	-14.8
Total	261,342	240,374	-20,968	-8.0

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (4,345,000 cubic feet in 1997 and 3,172,000 cubic feet in 1999).

Table 20—Roundwood timber products output by county, product, and species group, Piedmont of North Carolina, 1999

County	All products		Saw logs		Veneer logs		Pulpwood ^a		Composite panels		Other industrial	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
<i>Thousand cubic feet</i>												
Alamance	2,285	2,468	1,800	1,755	178	525	207	129	100	59	0	0
Alexander	1,229	1,080	929	761	0	98	300	221	0	0	0	0
Anson	13,058	1,845	6,929	767	2,119	61	4,010	1,017	0	0	0	0
Cabarrus	1,378	887	887	529	0	0	391	299	100	59	0	0
Caswell	5,522	2,547	2,705	1,610	0	354	15	174	2,802	409	0	0
Catawba	1,588	905	978	564	0	35	610	306	0	0	0	0
Chatham	13,649	3,677	8,789	2,168	1,072	721	951	404	2,766	384	71	0
Cleveland	2,203	1,748	501	907	0	0	1,702	841	0	0	0	0
Davidson	2,101	3,627	1,302	3,099	0	28	499	500	300	0	0	0
Davie	533	1,161	200	870	0	28	129	84	200	179	4	0
Durham	1,500	875	1,347	326	0	142	53	407	100	0	0	0
Forsyth	966	1,804	647	1,448	0	14	19	213	300	129	0	0
Franklin	6,042	3,271	3,137	1,654	369	699	2,536	918	0	0	0	0
Gaston	777	488	233	178	0	3	544	248	0	59	0	0
Granville	7,620	2,509	4,623	957	43	320	282	717	2,672	515	0	0
Guilford	1,748	3,056	1,504	2,591	0	15	44	331	200	119	0	0
Iredell	2,702	1,961	1,740	1,530	0	50	760	322	200	59	2	0
Lincoln	1,150	706	397	362	0	50	653	294	100	0	0	0
Mecklenburg	747	1,361	500	935	0	45	147	262	100	119	0	0
Montgomery	11,274	4,800	9,623	4,342	0	0	1,551	399	100	59	0	0
Orange	3,232	1,579	2,589	520	0	542	42	100	601	417	0	0
Person	5,635	1,734	1,470	648	0	158	24	489	4,141	439	0	0
Polk	1,610	1,472	707	861	0	0	903	611	0	0	0	0
Randolph	4,775	5,462	3,810	4,695	0	136	665	452	300	179	0	0
Rockingham	3,371	5,351	1,312	3,692	86	11	971	1,087	1,002	561	0	0
Rowan	2,550	4,012	1,614	2,121	0	28	836	1,863	100	0	0	0
Rutherford	3,932	6,444	1,589	1,676	0	0	2,343	4,768	0	0	0	0
Stanly	2,167	572	1,778	373	0	0	389	199	0	0	0	0
Stokes	2,881	3,180	1,920	2,407	0	0	19	287	801	486	141	0
Surry	2,356	3,551	1,748	2,743	0	0	17	406	401	402	190	0
Union	825	825	153	499	77	4	495	143	100	179	0	0
Vance	5,873	2,066	3,798	747	369	425	340	731	1,366	163	0	0
Wake	9,780	5,253	6,377	1,976	664	703	1,257	2,140	1,482	434	0	0
Warren	12,366	14,460	5,303	3,252	648	799	5,877	10,286	513	123	25	0
Yadkin	1,392	2,820	962	2,427	0	0	259	327	100	66	71	0
All counties	140,817	99,557	83,901	55,990	5,625	5,994	29,840	31,975	20,947	5,598	504	0

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (3,172,000 cubic feet in 1999).

Table 21—Roundwood timber products output by product and species group, Mountains of North Carolina, 1997 and 1999

Product and species group	Year		Change	Percent change
	1997	1999		
Thousand cubic feet				
Saw logs				
Softwood	24,867	20,640	-4,227	-17.0
Hardwood	29,948	31,157	1,209	4.0
Total	54,815	51,797	-3,018	-5.5
Veneer logs				
Softwood	16	156	140	875.0
Hardwood	3,141	3,744	603	19.2
Total	3,157	3,900	743	23.5
Pulpwood ^a				
Softwood	5,236	5,285	49	0.9
Hardwood	11,450	13,347	1,897	16.6
Total	16,686	18,632	1,946	11.7
Composite panels				
Softwood	1,725	927	-798	-46.3
Hardwood	1,246	752	-494	-39.6
Total	2,971	1,679	-1,292	-43.5
Other industrial				
Softwood	160	126	-34	-21.3
Hardwood	0	0	0	--
Total	160	126	-34	-21.3
All industrial				
Softwood	32,004	27,134	-4,870	-15.2
Hardwood	45,785	49,000	3,215	7.0
Total	77,789	76,134	-1,655	-2.1

-- = negligible.

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (151,000 cubic feet in 1997 and 1,232,000 cubic feet in 1999).

Table 22—Roundwood timber products output by county, product, and species group, Mountains of North Carolina, 1999

County	All products		Saw logs		Veneer logs		Pulpwood ^a		Composite panels		Other industrial	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
<i>Thousand cubic feet</i>												
Alleghany	2,097	1,730	1,938	1,530	0	45	5	152	100	3	54	0
Ashe	2,767	2,700	2,756	2,385	0	56	11	259	0	0	0	0
Avery	497	1,332	353	826	0	50	144	456	0	0	0	0
Buncombe	1,169	2,539	881	1,597	0	150	288	792	0	0	0	0
Burke	3,280	3,143	2,313	2,208	0	78	566	798	401	59	0	0
Caldwell	2,613	2,905	2,295	1,857	0	172	218	810	100	66	0	0
Cherokee	1,421	1,938	455	762	0	93	966	1,083	0	0	0	0
Clay	260	765	19	88	0	39	241	638	0	0	0	0
Graham	523	1,761	187	462	0	347	336	952	0	0	0	0
Haywood	564	3,470	228	2,297	0	245	336	928	0	0	0	0
Henderson	1,435	1,793	1,217	898	4	290	214	605	0	0	0	0
Jackson	666	2,489	255	1,410	94	304	317	775	0	0	0	0
Macon	437	2,321	103	915	46	597	288	809	0	0	0	0
Madison	1,218	4,202	975	2,971	0	501	243	730	0	0	0	0
McDowell	1,434	2,522	1,001	1,402	4	128	429	992	0	0	0	0
Mitchell	813	2,102	753	1,656	4	150	56	296	0	0	0	0
Swain	399	1,245	207	676	0	50	192	519	0	0	0	0
Transylvania	272	652	76	103	4	39	192	510	0	0	0	0
Watauga	838	1,299	830	1,130	0	0	8	169	0	0	0	0
Wilkes	3,324	5,622	2,761	4,042	0	109	165	847	326	624	72	0
Yancey	1,107	2,470	1,037	1,942	0	301	70	227	0	0	0	0
All counties	27,134	49,000	20,640	31,157	156	3,744	5,285	13,347	927	752	126	0

^a Includes roundwood delivered to nonpulp mills, then chipped and sold to pulpmills (1,232,000 cubic feet in 1999).

Table 23—Total roundwood output by product, species group, and source of material, North Carolina, 1999

Product and species group	All sources	Total	Growing-stock trees		Other sources
			Sawtimber	Poletimber	
Thousand cubic feet					
Saw logs					
Softwood	296,290	291,233	285,594	5,639	5,057
Hardwood	125,778	118,370	114,818	3,551	7,408
Total	422,068	409,603	400,412	9,191	12,465
Veneer logs and bolts					
Softwood	41,748	40,951	39,718	1,233	797
Hardwood	19,310	19,100	19,100		210
Total	61,058	60,051	58,819	1,233	1,007
Pulpwood					
Softwood	164,991	148,991	67,046	81,945	16,000
Hardwood	106,854	95,182	38,073	57,109	11,672
Total	271,845	244,173	105,119	139,054	27,672
Composite panels					
Softwood	27,450	24,788	11,155	13,633	2,662
Hardwood	8,860	7,892	3,157	4,735	968
Total	36,310	32,680	14,312	18,369	3,630
Poles and posts					
Softwood	1,759	1,307	702	605	452
Hardwood	0	0	0	0	0
Total	1,759	1,307	702	605	452
Other miscellaneous					
Softwood	19	19	15	4	0
Hardwood	0	0	0	0	0
Total	19	19	15	4	0
Total industrial products					
Softwood	532,257	507,289	404,229	103,060	24,968
Hardwood	260,802	240,545	175,148	65,396	20,257
Total	793,059	747,833	579,377	168,456	45,226
Fuelwood					
Softwood	7,081	6,101	4,942	1,159	980
Hardwood	53,141	48,750	38,513	10,237	4,391
Total	60,222	54,851	43,455	11,396	5,371
All products					
Softwood	539,338	513,390	409,171	104,219	25,948
Hardwood	313,943	289,295	213,661	75,633	24,648
Total	853,281	802,684	622,832	179,852	50,597

Numbers in rows and columns may not sum to totals due to rounding.

Table 24—Total roundwood output by species group, survey region, and ownership class, North Carolina, 1999

		Ownership class			
Species group		National	Other	Forest	Nonindustrial
and survey region	Total	forest	public	industry	private
Thousand cubic feet					
Softwoods					
Southern Coastal Plain	199,585	99	6,203	50,523	142,759
Northern Coastal Plain	169,569	3,673	483	64,038	101,375
Piedmont	142,687	392	8,257	10,225	123,813
Mountains	27,497	917	675	1,878	24,027
Total softwoods	539,338	5,081	15,619	126,665	391,974
Hardwoods					
Southern Coastal Plain	72,772		691	6,903	65,178
Northern Coastal Plain	62,445	136	1,899	9,207	51,203
Piedmont	119,842	354	2,034	7,335	110,118
Mountains	58,884	18,797	1,806	3,224	35,057
Total hardwoods	313,943	19,287	6,430	26,669	261,556
All species	853,281	24,368	22,049	153,334	653,530

Numbers in rows and columns may not sum to totals due to rounding.

**Table 25—Total roundwood output by species group, detailed species group, and product,
North Carolina, 1999**

Species group and detailed species group	Total	Product						
		Saw log	Veneer	Pulpwood	Composite panel	Poles and posts	Other miscellaneous	Fuelwood
Thousand cubic feet								
Softwood								
Cedar	3,054	1,913	111	762	221	6	0	40
Longleaf-slash pine	26,536	12,539	2,712	10,415	420	102	0	349
White pine	10,988	9,396	1	757	538	151	0	144
Loblolly-shortleaf pine	413,279	224,312	35,476	125,889	21,059	1,101	18	5,425
Other yellow pines	70,543	39,704	2,759	21,692	5,090	370	1	926
Cypress	13,425	7,208	687	5,203	121	29	0	177
Hemlock	1,514	1,218	3	274	0	0	0	20
Total softwoods	539,338	296,290	41,748	164,991	27,450	1,759	19	7,081
Hardwood								
Soft maple	35,567	13,632	2,181	12,765	961	0	0	6,029
Hard maple	312	186	10	55	8	0	0	53
Other birch	4,464	2,418	379	847	70	0	0	750
Yellow birch	77	37	8	20		0	0	12
Hickory	12,062	5,818	657	3,112	436	0	0	2,040
Beech	3,134	1,405	301	866	33	0	0	528
Ash	5,994	1,742	265	2,848	118	0	0	1,020
Black walnut	853	486	63	137	22	0	0	144
Sweetgum	40,873	12,563	2,504	17,759	1,115	0	0	6,932
Yellow-poplar	59,148	27,552	3,301	16,184	2,108	0	0	10,003
Blackgum-tupelo	18,958	5,840	1,395	8,250	256	0	0	3,217
Sycamore	1,042	574	63	190	39	0	0	176
Cottonwood	78	26	19	20	0	0	0	13
Black cherry	1,702	753	159	469	36	0	0	285
Select white oaks	34,299	15,235	2,425	9,506	1,326	0	0	5,808
Other white oaks	14,318	5,610	892	5,145	256	0	0	2,416
Select red oaks	14,143	6,676	888	3,895	297	0	0	2,386
Other red oaks	49,339	17,309	2,849	19,433	1,392	0	0	8,357
Basswood	121	79	12	9		0	0	20
Elm	3,141	1,192	220	1,122	75	0	0	532
Other Eastern hardwoods	0 14,318							
Total hardwoods	313,943	125,778	19,310	106,854	8,860	0	0	53,141
All species	853,281	422,068	61,058	271,845	36,310	1,759	19	60,222

Numbers in rows and columns may not sum to totals due to rounding.

Table 26—Total roundwood output by species group, detailed species group, and ownership class, North Carolina, 1999

Species group and detailed species group	Total	Ownership class			
		National forest	Other public	Forest industry	Nonindustrial private
Thousand cubic feet					
Softwood					
Cedar	3,054	10	53	352	2,639
Longleaf-slash pine	26,536	92	977	8,358	17,108
White pine	10,988	142	140	1,523	9,183
Loblolly-shortleaf pine	413,279	3,629	12,314	102,029	295,307
Other yellow pines	70,543	1,185	2,022	11,521	55,815
Cypress	13,425	8	112	2,882	10,423
Hemlock	1,514	15	0	0	1,499
Total softwoods	539,338	5,081	15,619	126,665	391,974
Hardwood					
Soft maple	35,567	2,236	889	3,587	28,855
Hard maple	312	0	0	0	312
Other birch	4,464	994	98	60	3,311
Yellow birch	77	30	38	0	9
Hickory	12,062	504	172	595	10,792
Beech	3,134	887	82	257	1,908
Ash	5,994	127	92	745	5,030
Black walnut	853	175	3	15	659
Sweetgum	40,873	79	536	3,814	36,444
Yellow-poplar	59,148	2,667	885	4,928	50,668
Blackgum-tupelo	18,958	151	443	2,333	16,030
Sycamore	1,042	0	3	1	1,039
Cottonwood	78	0	19	15	44
Black cherry	1,702	240	177	97	1,188
Select white oaks	34,299	1,360	852	2,450	29,637
Other white oaks	14,318	2,188	237	1,558	10,335
Select red oaks	14,143	3,153	228	641	10,121
Other red oaks	49,339	3,111	975	4,525	40,727
Basswood	121	22	0	0	98
Elm	3,141	0	33	254	2,855
Other Eastern hardwoods	14,318	1,362	666	795	11,495
Total hardwoods	313,943	19,287	6,430	26,669	261,556
All species	853,281	24,368	22,049	153,334	653,530

Numbers in rows and columns may not sum to totals due to rounding.



The Forest Service, U.S. Department of Agriculture, is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.

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Johnson, Tony G.; Brown, David R. 2002. North Carolina's timber industry—an assessment of timber product output and use, 1999. Resour. Bull. SRS-73. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 39 p.

In 1999, industrial roundwood output from North Carolina's forests totaled 793 million cubic feet, 9 percent less than in 1997. Mill byproducts generated from primary manufacturers increased 1 percent to 311 million cubic feet. Almost all plant residues were used primarily for fuel and fiber products. Saw logs were the leading roundwood product at 422 million cubic feet; pulpwood ranked second at 272 million cubic feet; veneer logs were third at 61 million cubic feet. The number of primary processing plants declined from 280 in 1997 to 278 in 1999. Total receipts declined 2 million cubic feet to 769 million cubic feet.

Keywords: Pulpwood, residues, roundwood, saw logs, veneer logs, wood movement.

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